

What is Claimed is:

1. Apparatus for processing multiple semiconductor wafers, the apparatus comprising:

a transfer chamber;

5 a first or master processing chamber mounted in fixed relation to the transfer chamber and having a first wafer-holding platform with a center;

a second processing chamber mounted in adjustable relation to the transfer chamber and to the first chamber and having a second wafer-holding platform with a center; and

a robot rotatably mounted within the transfer chamber and having first and second wafer-holding arms spaced parallel to each other for inserting a pair of wafers simultaneously into the first and second chambers and for placing the wafers accurately centered over the respective platforms, the spacing of the platform centers being adjusted relative to the spacing of the robot arms such that the wafers are centered and placed with a preselected degree of accuracy onto the respective platforms for efficient processing of the wafers.

2. The apparatus of claim 1 wherein the first and second chambers are closely spaced self-contained units supported in cantilever fashion from a wall of the transfer chamber, the chambers and the platforms being adapted to simultaneously process wafers using edge purging.

3. Apparatus for processing multiple semiconductor wafers, the apparatus comprising:

a transfer chamber;

30 a first processing chamber mounted in known relation to the transfer chamber and having a first wafer-holding platform with a center;

a second processing chamber having a second wafer-holding platform with a center;

35 a mechanism for adjustably mounting the second chamber in relation to the first chamber and to the transfer chamber, the mechanism providing a plurality of position adjustments for the second chamber; and

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a robot rotatably mounted within the transfer chamber and having first and second wafer-holding arms spaced parallel to each other for inserting a pair of wafers simultaneously into the first and second chambers and for placing the wafers accurately centered over the respective platforms, the spacing of the platform centers being adjusted relative to the spacing of the robot arms such that the wafers are centered and placed with a preselected degree of accuracy onto the respective platforms for efficient processing of the wafers.

4. The apparatus of claim 3 wherein the mechanism comprises a bellows assembly positioned between the transfer chamber and the second chamber and providing for relative movement and also a wafer passageway between the chambers while maintaining an hermetic seal.

5. The apparatus of claim 3 wherein the mechanism comprises:

- a first plate fastened to a wall of the transfer chamber;
- a second plate fastened to a wall of the second chamber;
- a bellows assembly sealed between the plates and providing for relative movement between the plates and an hermetically sealed wafer passageway between the chambers;
- and

means for securing the relative positions of the plates once adjustments thereto have been effected.

6. The mechanism of claim 5 wherein the first and second plates are hinged together along a bearing line such that position adjustments thereto can be made in "X", "Y" and "Z" directions.

7. Apparatus for processing at least two semiconductor wafers simultaneously, the apparatus comprising:

- a transfer chamber;
- a load-lock chamber adjacent the transfer chamber;
- a first processing chamber mounted in known

relation to the transfer chamber and having a first wafer-holding platform with a center;

a second processing chamber having a second wafer-holding platform with a center;

5 adjusting means for adjustably mounting the second chamber in relation to the first chamber and to the transfer chamber, the adjusting means having a bellows assembly positioned between the transfer chamber and the second chamber and providing for relative movement thereof  
10 and also providing a wafer passageway between the chambers while maintaining an hermetic seal; and

a robot rotatably mounted around a center axis within the transfer chamber and having first and second wafer-holding arms spaced parallel to each other for  
15 withdrawing a pair of wafers from the load-lock chamber and inserting the pair of wafers simultaneously into the first and second chambers and for positioning both of the wafers with a preselected degree of accuracy over the respective platforms, the spacing of the platform centers being  
20 adjusted to the preselected degree of accuracy by the adjusting means relative to each other and to the spacing of the robot arms and the center axis such that the wafers are centered and placed with the preselected degree of accuracy onto the respective platforms for efficient  
25 processing of the wafers.

8. The apparatus of claim 7 further comprising additional processing chambers corresponding respectively to the first and second chamber, the additional chambers being mounted relative to the load-lock chamber in ways  
30 respectively like those of the first and second chambers.

9. Apparatus for processing a pair of semiconductor wafers simultaneously, the apparatus comprising:

a transfer chamber;  
a load-lock chamber adjacent the transfer  
35 chamber;

a first processing chamber mounted in fixed relation to the transfer chamber and having a first wafer-holding platform with a center;

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a second processing chamber having a second wafer-holding platform with a center;

5 mechanical means for adjustably mounting the second chamber in relation to the first chamber and to the transfer chamber, the mechanical means supporting the second chamber against the load-lock chamber in cantilever fashion and having a bellows assembly positioned between the transfer chamber and the second chamber to provide for relative movement thereof and to provide a wafer passageway 10 between the respective chambers while maintaining an hermetic seal;

slit valve adjacent the passageway for hermetically sealing the transfer chamber from the second chamber; and

15 a remotely controlled robot rotatably mounted around a center axis within the transfer chamber and having first and second wafer-holding arms spaced parallel to each other for withdrawing a pair of wafers from the load-lock chamber and inserting the pair of wafers simultaneously 20 into the first and second chambers and for positioning both of the wafers to a preselected degree of accuracy over the respective platforms, the spacing of the platform centers being adjusted by the mechanical means relative to each other and to the spacing of the robot arms and the center 25 axis such that the wafers are centered and placed with the preselected degree of accuracy onto the respective platforms for efficient processing of the wafers.

10. The apparatus of claim 9 wherein the mechanical means provides for adjusting the position of the second 30 chamber in "X", "Y", and "Z" directions, and for thereafter rigidly fastening in place such position.

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